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ABSTRACT

Comments about the 11 papers presented at the June 1976 Pittsburgh conference on the theory and practice of beginning reading instruction are presented in this paper. In surveying these presentations, the paper discusses four content areas: particular theories about the reading process; problems in learning to read of poor, retarded, bilingual, and nonlateralized persons; systematic programs for beginning reading instruction; and the evaluation/effectiveness of reading instruction. In general, the paper concludes that while the conference was informative it was merely an indication that many problems in reading research and instruction must be solved, particularly in the area of evaluation. An attached transcript provides an audience discussion that followed presentation of the paper. (RL)

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Reflections on Two Days of Listening about Reading[1]

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Commentators have essentially three choices in the kind of commentary they give. One choice is to present yet another paper related to the conference theme but on one's own work or set of interests. A second choice is to pay slightly more attention to what occurred but to present your comments in a general way. The third choice is to deal more directly with the conference itself and to react to what was said in a candid and frank manner, with a willingness to provoke discussion. I have decided upon the third method, partly because I don't have a personal paper to give and partly because I am not very apt at making generalizations and partly because I would like to use my time as the first commentator to provide the members and the guests of the conference with an overview of the papers we have heard during the past two days. My comments shall, I hope, be both substantive and prescriptive with the goal of provoking both participants and observers to comment , defend and discuss. Admittedly, my treatment will be brief and superficial but I hope to serve some function here other than filling an allotted hour.

In surveying the eleven presentations, one can discern four main themes around which the papers revolve:

(1) particular theories about the reading process,

(2) problems in the acquisition or teaching of reading by the poor, retarded, bilinguals and non-lateralized persons,

(3) systematic programs for early reading instruction,

and (4) evaluation and effectiveness of instruction.

Theory

Each of us adheres to some implicit and, at times, explicit notion on what the reading process is all about. The prevailing view at this conference pictures the act of reading as a linear, "bottom-up" process analogous to speech perception, followed by comprehension, except that reading has the added, initial problem of rendering the print into speech. Both the theory and practice of beginning reading instruction is to assume that the process order dictates the instructional order, hence the stress on the decoding process of translating print into sound.

The widespread use of oral reading appears to be consistent with this view since when a child renders the print into acceptable sound, s/he can be said to "read." Danks and Fears, in their examination of what transpires in oral reading, adopted a two-stage, linear model against which to assess whether oral reading involves one or both stages. I think that it should be made clear that this analysis treats oral production as a "dependent measure," i.e. an outcome which is observed or recorded in an experiment. The stages are hypothetical entities assumed to occur prior to and/or during the outcome observed. By definition, decoding has to be involved and the central question now is whether or not understanding of what has been read or what one is about to read influences one's oral production.

After surveying the literature, Danks and Fears leave us with a rather unsatisfactory conclusion: one can, under some circumstances and special conditions, demonstrate that comprehension occurs in oral reading. What does this mean for the teacher? What does this imply for the practice? Their conclusion certainly does not imply

that comprehension is necessary for oral reading or that it is a characteristic found in the early reader.

What seems to be required is a more direct way of studying the question. Danks and Fears (see also McConkie, this volume) contribute procedures for advanced readers which could be adapted for use on younger subjects. Here, one deliberately manipulates syntactic and/or semantic relations within the sentence so that if the reader is using the past to predict what s/he is about to read, violations of the relations would lead to a disruption of the on-line, reading performance. This method is consistent, in part, with procedures used in cognitive psychology to assess stages of processing (Sternberg, 1969) where one manipulates a variable, A, which is known to affect Stage 1, and a second variable, B, which is know to affect Stage 2. If Stages 1 and 2 are independent, then the effects of factors A and B "add" in the treatment of the data. What Danks and Fears need to complete their approach is to manipulate another factor which clearly affects decoding (say, for example, clarity of print or acoustic confusions among words). If they can show additive effects, then their general model is supported, at least on the assumption of two independent stages. However, the stages need not be linear or sequential; they could be parallel or overlapping. Non-additivity would suggest an interactive ("bottom-down?") model.

Thus, Danks and Fears have raised an interesting theoretical issue. The existing literature and experiments, however, are not adequate to answer it. As far as practice is concerned, if the teacher <u>accepts</u> the child's oral production as a reasonable approximation to the text and if the teacher is <u>not</u> prescriptive about <u>how</u> the child says what he reads and if the teacher does not stress adher-

ence to a particular phonological expression of language, then it would appear that oral reading is a useful method.

In a similar but more explicit view, La Berge provides a micro-analysis of the decoding process. He also adopts a "bottom-up" model where analysis goes from unspecified features to letters to clusters to words on the visual side and from corresponding phonemes to syllables to morphemes and words on the acoustic side. His main concern is with the questions: How do we recognize a word? and How do we acquire the necessary structures to do so? The latter question predominates.

The value of La Berge's approach is that it is analytic. One can break down the visual stimulus into components and then speculate about what the reader must consequently do in order to perceive and interpret that stimulus as a word. The focus of the approach is on the reader's unit of analysis.

These units, sometimes referred to as "codes" when they are represented internally, have to become structured or linked within and across modalities. That is, visually, a word must be decomposable into letters (and lower level features) and these units must have some corresponding relation to their acoustic counterparts. La Berge summarizes via diagrams several possible relational structures within the visual system. He argues strongly for the development of "contextual" nodes which allow the reader to perform the analysis at different levels of unitizing. He omits, however, the relations between the visual and acoustic nodes, so much the concern of those who teach sight-sound correspondence.

La Berge shares the problems of any general feature model (cf. Gibson and Levin, 1975). What are the basic units and how can they be identified? How are the units represented internally? How

are they analyzed and acquired? How do they become combined? These questions and their answers represent only a small part of the more general problem of how we recognize objects or patterns. A feature analysis requires something like an analysis-by-synthesis model (Chomsky, N. and Halle, M., 1969; Neisser, 1967) for completeness as a model.

The appeal of the feature approach is that one can, by contrasting minimal pairs, show that letters or words differ by certain features. The question arises as to whether or not these contrasts are necessary or are made in reading or word recognition. The success of the whole word method and other forms of visual form recognition may very well rest upon the fact that any visual configuration, independent of contrast, can be perceived, identified and subsequently labelled as a configuration per se.

There are two other aspects of La Berge's paper upon which I would like to remark. First, contextual nodes play a role akin to "control processes" whereby the child can, at will, direct her/his attention to units of varying size. La Berge assumes that such nodes have to be established as a prerequisite for the later unitization of letters into clusters and words. The postulation of the context node, however, seems to push the question further inside the reader's head and it remains unclear to me how and what these contextual nodes are and from where they arise.

A second and related point is that the child already has highly developed speech by the time reading occurs. Contrary to La Berge's claim, children do not perceive the speech of another as an undifferentiated stream (speech spectrograms do, though). They can segment words and produce them as in, "Say 'dog,' Johnny." If segmentation

did not occur, how could Johnny say "dog?"" In addition, Williams (this volume) has shown that children who are poor learners in general can isolate syllables from words quite readily and this skill apparently can be used to transfer segmentation strategies to the isolation of initial word consonants (which Wallach claims is so impossible). It may be that the higher order units are already available in the acoustic domain and that by Gestalt principles of grouping and spacing of letters, letter configurations can be assimilated to these units. Finally, the co-occurrence of some combinations of letters more frequently than others must play a role. One can specify a set of rules for combining consonants and consonant clusters plus vowels, e.g. STR + vowel or Sp + (r,l) + vowel, and these are presumably derived from the child's noticing their occurrence in spelling patterns.

In striking contrast to La Berge's microanalysis is the macroanalysis of reading by Gregg and Farnham-Diggory who valiently tried to meet a request for an information processing approach to the task. One has to agree with their goals that one would like models to be explicit. The problem with a comprehensive model, especially for something as complex as reading, is that there are too many options within the framework.

The model proposed is also linear, a string of past models developed for different purposes in cognitive psychology and artificial intelligence, and dealing with different problems: attention, short-term memory, semantic memory etc. Each of these, in turn, is but one representative of several alternative models, only part of which are verifiable. This linear string of linear processes faithfully reflects some of the better approaches in cognitive boxology but the inherent sequentiality fails to capture the interactions between the systems that must occur.

I wish that Gregg and Farnham-Diggory had dwelled more on their briefly-presented taxonomy of reading tasks rather than on the model. One could argue that an analysis of the reading task as well as the resources and skill of the reader constitute the necessary prerequisites to the development of an information processing model. As it now stands, the model they present could exist if reading never occurred; it is thus a model of a general information processor.

Their table which summarizes the taxonomy seems to be more than two dimensional. It contains an implicit developmental model, moving from pre- to skilled reading levels, thus classifying the overall state of the reader. The sight-sound correspondences are analogous to those described previously except that at each level there is the useful addition of a set of rules for the use and combination of the stored feature, letter or word list. Task complexity is another feature and examples are given where the child is asked to just read a letter versus read with feeling (add prosodic features), asked to recognize a figure versus provide a diagram of it (recognition versus reconstruction or recall), asked to find the meaning of a single word versus reasoning through a logical proposition, asked to find the "meaning" of a word versus the meaning of a longer narrative. Each of these tasks demands a model in its own right, but they sensitize us to what is being asked of the reader and force us to begin to wonder on how each of these is accomplished. A further description would be most welcome and more in the spirit of an information processing analysis.

Of the three papers on theory, La Berge is alone in addressing the problem of acquisition of skill. I am afraid that practitioners are going to be disappointed with the present offerings. For some reason, current theoretical work in cognitive psychology and information processing seems preoccupied with detailed description of the underlying mechanisms, operations or processes by which a person solves a problem task rather than the mechanisms by which the know-

ledge and skills required to solve the problem are learned. Knowledge, often in the form of list structures, is given not derived. This is probably because computers, the main analogy for most information processing models, operate on data but do not acquire either the data or the operations. It is also historical--learning was closely identified with the unpopular behaviorist tradition. This continued neglect, however, by modern cognitive psychologists may prove to be one of the major stumbling blocks in its path to answering our questions successfully. One value of returning to a learning orientation, regardless of ideology, is that one seeks to know the conditions under which learning is promoted as well as the possible mechanisms for its operation. Even in La Berge's account, too much is left to "automaticity" and unspecified ways of change. There is a serious need for a revival of instructional and learning theory here.

McConkie reflects this lament with a series of disturbing questions about our assumptions of the skilled and beginning readers as well as our general lack of real knowledge about them. McConkie's solution, however, is decidedly empirical: one can, he asserts, learn much about reading by measuring eye movements during its occurrence. However, this approach, thus far, seems to be restricted to the more advanced and older, skilled reader. The question is, Can one, as in the Danks and Fears on-line procedure, adapt the method for use in the study of the beginning reader? Is the eye the pathway to the mind of either the early or skilled reader?

In McConkie's empirical approach, one studies the act of reading by studying eye movements; its product is studied later. The problem is that even empirical observation must be guided by some theoretical orientation, even the choice of variables to be manipulated. One needs to examine the reasons for one's selection of variables, both independent and dependent.

McConkie's contribution should not be underated. He and his colleagues have developed reliable on-line methods for studying how much information can be taken in during fixations and saccades by a computer-controlled procedure where changes in the material being read are made contingent on eyemovements. His finding that fixations increase in the face of semantic change indicates that comprehension processing occurs during the fixation. However, his finding that manipulation of the size of the perceptual span was unrelated to the subsequent retention of the material would have led me to conclude that eyemovements or at least perceptual span were unrelated to reading comprehension. Apparently, readers are flexible in the strategies they use and can overcome some limitations imposed on them.

Problems

Reading problems are not the province of the individual reader or the classroom. They are, as Natalicio so clearly indicates, linguistic, social and political and, in some cases, they may, as Mackworth suggests, have a biological basis.

Natalicio and Simons treat current social and political issues having to do with how minority populations can achieve literacy comparable to that for members of the middle-class, white American society.

In Natalicio's paper, the central question is whether or not literacy should *first* be achieved in the child's native language. There are several problems here. There appears to be no homogeneous group of Spanish or Black English speakers in the United States. If one taught the native language, one would be adopting a standard, codified Spanish or Black English at variance with the speaker's dialect. Further, it is unclear whether there would be transfer of a positive nature between the reading achievements of the first and second languages. Given the need to make areadjustment in the sight-

sound correspondence (since the alphabet is not a syllabary for either), one might well anticipate interference.

Natalicio's analysis is based on the assumption that the training would be sequential, learning to read first in one's native language, followed by learning to read in one's second language. Pat Suppes, in discussion, raised what I regard as a fundamental alternative: Why not consider parallel training where children learn to read in each language according to their respective competence? The training is done simultaneously but separately. By keeping the training separate, one can achieve independent bilingualism (see Riegel and Freedle, 1970, who discuss different kinds of bilingualism), and minimize negative transfer. Regardless of whether the child was to learn to read in either one or two languages, what the child knows linguistically will have to be taken into account as good educational practice. If there were general language arts training in each language, reading would be a natural part of the curriculum and hardly revolutionary. I don't think one need be so pessimistic as Natalicio's careful and complete discussion of the issues lead one to be.

Simons puts the problem more in the role of the speaker of the nonstandard dialect. He asks whether speaking Black English vernacular "interferes" with the acquisition of reading. His answer is that there is little or no evidence to support the idea that a mismatch between one's language and that of the standard is interfering. While he may be correct, one would like to have seen experiments that were more sensitively designed on the issue. That is, one would have to define precisely what the mismatches are, select materials to be read or learned which are representative samples of these mismatches, motivate why one would expect to see interference by a psychological process model and test for its occurrence, including control items which should not interfere. From Simons' review, I did not feel th

much of the research met these stringent, but minimal, criteria. Since the most obvious differences between Black and White speakers appear to be phonological, Black English speakers may have the most difficulty in having their oral reading product accepted by the teacher (cf. Danks and Fears, this volume). This puts the problem elsewhere than in the reader's head.

In discussions of Black English, writers often fail to make a distinction between standard English which is codified and written versus "standard" English which is a preferred spoken form, ostensibly that used by the radio and television broadcasters (who frequently read reports, advertisements etc. aloud) or by elementary school teachers. If the speaker of a Black English dialect is criticized for his/her pronunciation, then, as I said before, the interference is not internal to the reader but external in the teacher/child interaction. Hence, Simons' shift to the dialogue analysis as a source of ideas about what takes place in the classroom and beginning reading instruction is a very reasonable tack. In these kinds of observation, one can find sources of miscommunication and failure to accept dialect variation.

Courtney Cazden, in her commentary, discusses this approach at length and I want to add briefly to it here. These investigations of communicative strategies do enable us to "take a walk in the classroom" and see what goes on. Simons, on the other hand, emphasizes what he calls non-shared assumptions in the failure to communicate. If one is interested in the acquisition process or didactic effectiveness, it would seem to be useful to look for the acceptance or rejection strategies (Nelson, 1973) of the child's oral production as well as other reinforcement or modelling behavior on the part of the teacher. The emerging emphasis on teacher/child, mother/child interaction in

communicative settings tends to yield highly detailed description but lacks economical data reduction and theoretical force. One needs to have some a priori guidance on what to observe and on how to reduce the potential mass of observational data which flow from this descriptive-analytic approach. Can one find protocols of good and successful teacher/child interchange? Can one compare these with poor protocols? Would such contrasts help teachers learn better teaching and communication strategies? Is shared knowledge and assumptions so critical as Simons would have us believe? Teaching situations are ones where knowledge is not as yet shared and the game is transmission to achieve sharing. It seems less a matter of sharing knowledge or assumptions than the teacher's being more sensitive to and accepting of the child's attempts.

Mackworth's paper suggests that some reading disabilities may have a clear biological basis. Children whose speech appears to be of mixed laterality, i.e. located in both hemispheres, also show deficits in linguistic and spatial skills. I wondered whether or not one could use the laterality tests as a predictor rather than be content with them as correlates. That is, measure a child's laterality (and perhaps other linguistic and spatial skills) prior to the teaching of reading. If one had a reasonable number of children who show the different kinds of laterality Mackworth describes, one could make up a 2x4 table for reading success/failure by the four laterality categories. Would one find a significant Chi-square, showing a relation between lateralization and reading performance? As the Mackworth "review" now stands, we only know that children who are brain damaged or of mixed laterality have visual and spatial skill problems which are related correlationally to reading. The cells of the table are woefully incomplete, making for poor science.

I also raised but failed to get answers on the following questions: What is the frequency of occurrence of indeterminate versus mixed laterality? How accurately is the latter measured? What causes mixed laterality? Can persons of mixed laterality be trained to read despite their visual/spatial problems or are these deficits a permanent handicap? I was particularly bothered by the strong inferences being made when children actually performed a task but were regarded as deficient when they were, in fact, merely slower. That is, they could do the tasks, but took longer. That fact has an entirely different meaning than when a child cannot do something. Mackworth was less than careful (and critical) in her presentation of data and inferences.

Programs

This section deals most closely with one of the conference subject titles, namely early reading practice. As we shall see, each program is motivated by some implicit theory about the reading process.

I recognize that to construct and implement a reading program represents a considerable undertaking and I should hope to temper my critical remarks because of this consideration. In this conference, four programs were described, two of which are prereading or supplemental (those of Wallach and Williams) and two of which are full programs. Of these, the first two and the New Primary Grades Reading System, reviewed by Popp, are "bottom-up" approaches and emphasize decoding skills. The fourth, Scott Foresman's Reading Unlimited, also reviewed by Popp, is a "top-down" approach, emphasizing the use of the child's knowledge of the context in which the stories occur. The programs are sufficiently complex and varied to virtually defy simple contrasts. Popp's informative comparisons and criticism represent a genuine service.

Perhaps the strongest claims are those made by Wallach. He argues that phoneme identification skills are a necessary prerequisite for learning to read. One supposes that if the particular reading program emphasizes decoding and phonemic skills, then he may be correct. It is hard to see how this claim holds for a program such as the one developed by Scott Foresman. Perhaps Wallach's basis for his claim rests with the baseline against which he began and the success his tutors had with a difficult sample of potential readers. The problem with accepting his claim is quite simple, however, since the phonemic identification training is but one part of a larger program and without a control comparison, one cannot decide what led to the success he claims. This problem, namely, what control comparisons are necessary in order to decide that a program is what it claims, holds for all programs and is not unique to Wallach's.

One reason that phoneme identification or segmentation is difficult, both for adults and children, is that the phoneme is not a basic, psychological unit. Williams' (this volume) review and procedures suggest that one can more readily segment and identify syllables and that such training can be used to get across the notion of segmentation of sounds within words. The New Primary Grades System uses visual aids as mnemonic supports and physically demonstrates via blocks which can be moved together and apart the idea of segmentation. La Berge might see how to relate the visual and acoustic systems by an examination of how segmentation and blending are achieved with the non-print visual and acoustic cues used in this program.

Another reason for the difficulty of the phoneme identification task is that there is not a close correspondence between phonemes in isolation with those segmented from a word. The initial consonant

of the m.m.man sounds like "muh" not /m/. Further, in tying this to letters, since English alphabet is not a syllabary, the letter names and sounds differ from the phonemes. These differences must be an additional source of confusion to the child. The difficulty is further compounded when phonemes are "blended" into words since they change when combined with other phonemes so that they are no longer clearly recognizable.

Given these sources of difficulty, it is impressive, indeed, that Wallach succeeded. Thirty-six weeks of tutoring strikes me as rather extensive and intensive and one must wonder whether that much training is both necessary and worth it. Wallach's reporting on success is hard to judge since he reports proportions passing at some percentile level without controls. The evaluation is done, not on reading performance, but on standardized, reading-readiness tests. How well do the children do when they are taught to read?

Williams, in contrast to Wallach, is more modest in her claims and program. She worked with children who had records of learning problems whereas Wallach's children were lower class. Williams offers a stronger experimental rationale for her choice of procedures and materials. Her program was developed as an alternative to the discredited perceptual-motor training approach. She is cognizant of the literature on phonics and recognized the problems associated with phoneme segregation and blending (Shankweiler et al., 1974) and, as a consequence, adopted the easier syllable segmentation procedure. She also used efficiency criteria for training phoneme discrimination, analysis and segmentation such as avoiding acoustic and visual confusions, ease of blending, use of short words such as trigrams (cat, boy etc.), all of which have a basis in the research

literature. The main problems have to do with how well her program blends into existing ones, whether her students show transfer and evaluation of what she had accomplished.

The New Primary Grade Reading System developed here at the Learning Research and Development Center is a highly structured and full phonics-oriented program. It is clearly a "bottom-up" approach, adhering closely in principle to the basic theory subscribed to by most of the participants here at the conference. It is quite apparent from Popp's review that meaning is minimized although it would seem that meaning must occur in the workbooks, read alone etc. If the materials and procedures place such a heavy stress on basic phonic skills, I kept wondering as I learned about the program what it was that would sustain a child through such a program. The proof is in the pudding. If the children move from this program into the middle grades and show good reading achievement, then some kind of fundamental basis was laid. Popp could have provided us with some evidence on evaluation here (or perhaps it is too soon?).

Popp provided less in the way of critical commentary on the New Primary Grades Reading System than she did for Scott Foresman, although she also praised the latter more. The examples provided, especially those on fairy tales, certainly suggest the Scott Foresman program would be the more interesting one to participate in as a student. It is unfortunate that those who designed the Reading Unlimited program were not more careful in the construction of drill and test items so that both reading and comprehension are assured. Popp's criticisms of these items are worthy of study and should be of use to the test construction people at Scott Foresman.

Aside from the Reading Unlimited program, this conference has not addressed the question of "context." Context has several meanings but it, or should I say, they have an influence on reading.

One context is the word itself. It is well known the letters are more easily identified when they occur in words than when they occur in non-word letter strings or alone, the so-called "word superiority" effect. Another context is the sentence itself. Here, the other words and the meaningful relations among them allow the reader to anticipate something about the remaining words to be read. This idea, in part, is contained in the Reading Unlimited program. Selectional restrictions on verbs can play a role here as:

(1) The farmer plowed the _____

(2) The farmer fed the _____

In (1), the verb "plow" takes on an inanimate object while in (2), "fed" most likely has an animate object.

Another "context" is across sentences. Consider the following three pairs of sentences which Dave Nicholas, one of my students at Princeton, developed:

(3) Mary had a little lamb. Its fleece was white as snow.

(4) Mary had a little lamb. She spilled gravy and mint jelly on her dress.

(5) Mary had a little lamb. The delivery was a difficult one and, afterwards, the vet needed a drink.

In (3), "Mary" refers to a nursery rhyme character, a little girl who is followed about by her pet lamb; "had" alludes to ownership, and the animal is alive and well in this context. The sheep does not fare so well in (4). Mary, here is probably human and female (the new dress allows this inference as well); she may be a child (having spilled food). The references to gravy and mint jelly, however, indicate that the lamb is a meal, not a pet, only a small portion of which Mary ate. Finally, in (5) above, the references to veterinarian and a difficult delivery suggest that Mary has given birth to a small

lamb and is, herself, a mature ewe. The vet is probably an adult, male human being whose profession is to tend to sick animals; the drink, presumably, is an alcoholic beverage intended to enable the vet to relax after the difficult delivery of the lamb.

This cursory analysis reveals that a considerable amount of knowledge--about nursery rhymes, ownership, pets, little girls, sheep, food, animal births, veterinarians and alcohol--must be brought to bear in order to understand sentences (3)-(5).

Another meaning of context, again one that is used by the Reading Unlimited program, is the knowledge of the world that the reader has at his disposal to interpret the meaning of the print.

Consider the following passage taken from a study on comprehension and memory by Bransford and Johnson (1973). Read over the passage and see if you can understand what it is about:

> The procedure is actually quite simple. First, you arrange things into different groups. Of course, one pile may be sufficient depending upon how much there is to do. If you have to go somewhere else due to lack of facilities that is the next step, otherwise you are pretty well set. It is important not to overdo things. That is, it is better to do too few things at once than too many. In the short run, this may not seem important, but complications can easily arise. A mistake can be expensive as well. At first the whole procedure will seem complicated. Soon, however, it will become just another facet of life. It is difficult to foresee any end to the necessity for this task in the immediate future, but then one can never tell. After the procedure is completed, one arranges the materials into different groups again. Then they can be put into their appropriate places. Eventually, they will be used once more and the whole cycle will then have to be repeated. However that is part of life.
>
> (Bransford and Johnson, 1973, p. 400)

If you have not already figured out what is being referred to in this passage, let me give you a hint: washing clothes. Now does it make sense? Bransford and Johnson (1973) showed that if the person had the context given to him prior to reading the passage, recall was much greater. This result suggests that what the context words do is to allow the reader to bring into working memory information about what s/he is about to read and to assimilate the newly read information into an existing structure. If the reader can assimilate what is being read, then the process continues smoothly; if not, the reader might lose his/her motivation and "tune out." There is another analogy here: It is virtually impossible to continue to listen to a conversation in a language you don't understand or of which you have little understanding. Speech perception in the sense of hearing and sensing the stream of words is not enough. In this sense, comprehension is a part of speech perception and reading.

Evaluation and effectiveness

Of the eleven papers at this conference, only one is explicitly concerned with answering a question of evaluation, namely that of Guthrie, Samuels, Martuza, Seifert, Tyler and Edwall. Others, Wallach, Popp and Williams presented some data or considered it as a part of their contribution, but it is safe to say that evaluation has not been a central theme. It should be or at least we should expect it to be more so in the future. During the conference, one participant told me that evaluation gets so little consideration because after you have spent two or three years developing, implementing and improving upon a reading program, in addition to writing it up and publicizing it, you are too exhausted to do an evaluation. This is understandable. Perhaps the consumers should then take on the responsibility.

The responsibility is not an easy one as Guthrie and his colleagues found out. They began their quest with a sensible and simple set of questions, questions to which all of us would like to know the answers: Do children need formal reading instruction to learn how to read? If so, how much instruction is beneficial and what kind or kinds of instruction are most beneficial? Do some children benefit more from one kind of reading instruction than other kinds? Does instruction benefit low achievers in reading? All are reasonable questions.

The surprising, but disappointing, result is that we do not have an adequate set of data to provide us answers on any of these questions! Guthrie and his colleagues took what was available from an elaborate questionnaire study carried out by the Educational Testing Service for apparently other purposes. Guthrie et al. hoped to be able to use these data to answer some, if not all, of the above questions. Using mean scores of groups of children, they carried out a correlational study using analysis of variance and covariance procedures. They could have, and perhaps should have, used existing multiple-regression procedures since they could have obtained the same information on main effects and interactions, treated their variables as continuous rather than discontinuous or even dichotomous, and also obtain regression weights or percentages of variance accounted for by the several factors under examination. The most disturbing finding to me was the fact that the tests used for reading skill by ETS did not show the same significant effects or interactions. Either the tests are measuring different aspects of reading or they are measuring different aspects of something unknown. The low intercorrelations among tests purporting to measure

the same abilities is of concern. Of course, we don't know how accurate the teacher/principle questionnaire data are anyway, so part of the unreliability of measures may reside in misclassified scores for the independent variables.

The Guthrie et al. study is a good example where a small, well-designed, representative, well-planned, and well-executed experiment would have yielded more reliable information at considerably less cost than the massive questionnaire-correlational procedure. The value of the experimental approach would seem to be that more care is taken in consideration and manipulation of the independent variables, e.g. what the teachers actually do, and in selection of the dependent variables, e.g. what the child does. The reliance upon self-reports may represent a first approximation to what goes on, but it is at least one step removed from what goes on.

I wish I could say something more positive on evaluation than I have said. I clearly think we need more; I clearly expect we'll see more.

In conclusion, while I don't know how representative the conference is of work on theory and practice on early reading, I do know that I learned a great deal from each of the contributors. I suspect that several of these contributors are on th leading edge of the field, that research and programs on decoding are just coming into vogue and that their effectiveness will be felt during the next decade. I appreciate the opportunity to listen in on what has and will be happening.

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FOOTNOTE

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OPEN DISCUSSION OF TRABASSO PRESENTATION

LaBERGE: Tom wants me to join him in combat. I refuse because I actually agree with many of his points, and certainly the direction of his priorities. I believe that reading begins with the eye; if you close your eyes, you have trouble reading. The point is, what we pick up when we look at something is influenced by something besides just what's presented on the page. Whether we are going to look at parts of a word depends upon whether it's a new word or not.

Are we going to sound it out, "decode" it? Of course, the affluent reader has the option of going down to smaller units such as parts of words; in fact, he could go down to the features of the letters and determine whether or not the handwriting he is perceiving is of certain category or not.

I was talking to Mike Wallach about this. I thought his ideas about starting with the auditory domain, which is a point you brought up, may present the kind of control a child has to learn to "pick off" the first letter of a word on cue of the teacher, or the last two letters. But what is the nature of this interaction? That's the big question.

What we have been trying to do is to assume context codes and very cautiously add what we think is required to account for the data, which we think must go hand in hand with theoretical changes, and we are going quite cautiously.

You saw the experiment which we talked about controls of levels of processing, and how we indicated the properties of a mechanism, namely contextual nodes for selecting these levels. Now, what we didn't indicate were the lines from the auditory, or from other systems--lines for those systems to feed forward and intereact with what comes off the retina. That we haven't established. (We

could draw lines, it is easy to do that, but there is not clear experimental indication of how this would be done.)

We say not only do contextual controls feed forward from the auditory systems to determine how we are going to look at what we see, but also, as I think you could have pointed out, it feeds forward from the comprehension systems. For example, when a child is called upon to answer certain kinds of questions, he may look at a word, he may look at a phrase, he may look at a paraphrase, or he may look at combinations of those.

The question of how we should account for this I think is answered by a style of research, and a particular style of research in which I have been imprinted upon, having gone to Stanford. If you let your theory get too top-heavy--by top-heavy, I don't mean top-downness, that is you let your theorizing rush far in advance of your data, pretty soon you find your theories become less and less testable, and you begin to want to believe in them more and more, and you become defensive when you stand up in front of people. But if you are inoculated daily or weekly by results from your own laboratory that often tell you you are wrong, then you don't get the attitude of defending a theory. You get the attitude, which I think it is appropriate, of working between data and theory, in a very, very close way, and you begin to learn that the virtue of a theory is its short-livedness.

That is, a theory that has lasted too long is probably not very useful. It should suggest the next experiments which should be carried out, and also to indicate the priorities of experiments.

TRABASSO: I want to make one small reply, and that is it seems to me that if one takes seriously information processing and the task environment, that one could

find in the task environment, the sequencing of structured events which give rise to the integration or unitization. It is necessary to have these in order to integrate. The question is: Can you infer how things are sequenced, when unitization takes place, and the process by which it occurs?

LaBERGE: Unless you understand how a unit is constructed in its function, how are you going to talk about acquiring it? I put six models up there that indicate the state of the ambiguity of the art right now. I didn't say science, the art. I can name a person I believe for each one of those six models, each a respected experimenter.

TRABASSO: Dave LaBerge, Dave LaBerge, Dave LaBerge.

LaBERGE: No, Phil Gough, Estes, Neal Johnson, and Gibson, hold views that correspond to the several models I just presented. I tried to present those views in a neutral way.

TRABASSO: I didn't address my comments to those models.

LaBERGE: And until you know what each of those models holds, it is very difficult to indicate what kind of procedures are going to be used in acquiring a unit.

If a unit is formed simply by looking at the letters, and combining the letters, then you are going to tell the kid, "Read every letter carefully." But if a word is made up by picking up internal relationships, such that the individual letters are not activated anymore, a view that Gibson favors, then you are going to be counterproductive if you tell the child to look carefully at each

letter as he is learning the unit.

RESNICK: I think that is not necessarily so. That kind of claim is based on the assumption that what you teach the child to attend to is what the child will be attending to after he becomes skilled. I don't know of evidence for this in reading, but I can point to it clearly in early learning of addition. These are experiments that build on some of Pat Suppes' work. At the age of six kids do a rather complicated thing, where they set a counter to the larger of two numbers, thus showing that they know something about laws of commutativity, and then increment by the smaller of two numbers. We teach them a much less elegant way of solving the addition problem, but it is a teachable one which, in my experience, the elegant one is not. We teach them to count the number on the left, and then count out the number on the right, and then put them together. What we observe, over 10 weeks of time, is that they change from what we teach them to what is the more elegant and efficient way of doing the job.

I am sure there are such things happening in reading, and we have to follow those changing processes. We can't assume that because one model is what you observed in a given person, there never has been another one.

LaBERGE: What Tom is asking is exactly what conditions produce that movement of change from looking at things bit by bit to looking at things in larger units? That was his question, and I was under the impression that there were data existing in the field of reading that had shown that overemphasis in drilling small units, in the perceptual pickup, was counterproductive for transfer to picking up larger units. There are similar illustrations in the field of music. You can't do the fast passages if you concentrate on each single note.

RESNICK: Is there evidence that drill on the low level units does inhibit this transfer to higher level? Does anybody know where that evidence is? A lot of us assume that.

LaBERGE: No, but that would be a very productive point of the conference, if the important question seems to hinge on it, then we should go out and do some experiments.

WALLACH: I think even the general work in decoding versus comprehension suggests that the reality is a little different from what you just described. You can help the kids comprehend better by giving them word decoding training.

LaBERGE: No, but that's not the question. Decoding training does not specify the level of decoding.

FARNHAM-DIGGORY: Chall has stuff on this, too. It's around.

RESNICK: There are lots of claims, but I guess I am wondering where the data is.

LaBERGE: What prompts a teacher to move up and tell a kid, "Say it all at once, don't just keep sounding it out carefully."

You can hear when a child reads, that his is word calling. That is one of the indicators of word calling, isn't it, the feeling that you get that he is not shaping the units, or grouping the units in a large way, three or four words together in a phrase. And I bet they are not comprehending it.

WALLACH: You are implying an instructional hypothesis about how you overcome the

problem, and the hypothesis I think is necessarily correct. Maybe they need more attention to some of the smaller units, if that's the problem that you are having.

LaBERGE: This sounds terribly vile and ugly to me.

WALLACH: That's often the way learning proceeds.

LaBERGE: I find myself on the side of a fence that I haven't often been on.

LESGOLD: Tom, you argued for more controlled, contrastive research, to appraise the effectiveness of some of the programs that we discussed here. You also argued for, as did Pat Suppes, more descriptive research in the course of trying out some of these programs.

Now, the descriptive research I agree with entirely. We need to know more about what actually happens in the course of teaching kids.

However, I think the argument for contrastive research in curriculum is one that has to be considered very carefully. Controlled contrasts are almost always impossible.

If we really didn't know anything about how to teach kids to read, then we would be able to conduct experiments in which we tried out one method or another, and some worked and some didn't. The fact is some of us sometimes succeed in teaching kids to read, and even worse the public thinks they know something about which of us succeed and why. Thus, contrastive experiments turn out to be impossible. They are sabotaged by teachers who will teach what they think works, whether you include it in a curriculum or not.

I think we scientists sometimes are a little bit too glib by saying, "Well, what we really ought to do here is try out these methods, and make sure we can control when the method works and when it doesn't."

We have to work on defining some of the descriptive procedures, so that we can make inferences about what parts of what methods are effective, without relying upon controlled contrast, which probably can't be done.

TRABASSO: You may be right. Okay. Now, you are saying the pragmatics don't allow it, or it is unlikely, and therefore we shouldn't do it. I am not sure that it's really been tried.

LESGOLD: Well, let me just give you an anecdotal example.

It was of some interest a few years ago for the Navy to find out whether Vitamin C stops colds. One the of reasons they wanted to find this out was that on submarines if one person gets a cold, everybody gets a cold. So they conducted a nice controlled contrast experiment. Group A on the submarines got Vitamin C, and Group B didn't. Unfortunately the sailors had a theory about the effectiveness of Vitamin C, too. Every time, the sailors came into port there was a black market in Vitamin C. So there is no reason to believe that one group get more of it than the other.

The same thing happens in schools all the time. The teacher who is given a system using a whole word approach, but who really believes that phonics works, is going to do phonics. And even if the teacher doesn't, the parents are going to insist on it, and even if the parents don't insist on it, I think there is a serious ethical question in doing controlled contrast research when you know the only people you can get for subjects in such experiments are the people who are

most likely to have the reading troubles in the first place.

I think we really have to learn as psychological scientists to be more like astronomers than like chemists and find ways of confirming theory through predictions about what kind of observations and what kind of correlations of observations we are likely to see, as well as, perhaps, by doing experiments that support pieces of the theory on which a particular program is based.

But I don't think we can get very far concentration on controlled effectiveness studies of reading. Reading isn't like aspirin. You can ask a person to have a headache in the interest of research on aspirin effectiveness. Are we prepared to ask people not to learn to read?

GREGG: Well, I am much calmer now than I was before, after that erudite discussion, but I do have a couple of points that maybe everyone around the table understands, and it is just me that doesn't.

I have heard at least three meanings associated with the concept of decoding, and so following the conventions of Quillian, who had decode 1, decode 2, decode 3, I thought I would like to propose the three definitions, and then let us map which one we are going to call which one.

The first one, decoding is a collection of skills necessary to learn how to get meaning from the grapheme code. I seems to me that would be terribly important, and I propose that one as D-1.

D-2 is the process of perceiving lexical units fairly automatically, when one reads, it is the one that Joe Danks and Ramona Fears used in their paper, the first part, it is decoding, and then the next process is comprehension.

But a third one is that it's the task that one performs when the normal processes of automatic perception fail to generate some contact with semantic memory; it is something that we fall back on.

I guess I believe that the decoding is up front. It is foolish, I think, not to think about reading, when you have to have something in front of you, it has to be bottom up, at least for the first few seconds, or for the first eye fixation.

I don't know whether this is helpful or not, but I really have had a great deal of trouble at this conference and the others trying to figure out what people meant when they said "decode" and "comprehension," and when they start talking about what the teacher should do, (implying an acquisition level), and then throw in a skilled reader. We might expect quite different behaviors from these situations. The role of phonics, then, is sort of a backup skill, or something that would happen when the visual perception fails. Think about what would happen if a node in your semantic network would light up if somebody came up to you and said "Mmmm," and this was supposed to somehow trigger off the first sound of the word "Man." I never hear "Mmmm" when I say the word "man" so obviously all of the phonics training is creating the right kind of skills in a very complex, visual, speech motor task, that ought be be analyzed in its own right.

Recess

June 9--A.M.

COMMENTS BY RACHEL WEDDINGTON

RESNICK: I have asked Rachel Weddington if she would take a few minutes to tell us about some of her experiences.

WEDDINGTON: I was interested primarily in bilingualism and black dialect, and called into memory my experience as the resident director of a program in Puerto Rico, an exchange program called "Study Abroad." It was the first year that this program was introduced in Puerto Rico for the City University of New York. City University had programs in Spain, England, Germany, European countries. The purpose of the program was to provide the opportunity for students who were going to teach in the New York schools, to understand the Puerto Rican culture, so that when they came back to teach in the ghettos in New York City, they would be more understanding, sympathetic, et cetera.

In order for them to participate in that program, they had to be proficient in Spanish; most of the students that went were either majors or minors in Spanish.

The person who went as resident director also was supposed to be proficient in Spanish, but all of the people who were proficient in Spanish were unable to go, and because I had been off with students before, I was asked to learn Spanish and go with the students. So I consented to do so, and I was sent to Madrid for six weeks, a reflection of values of the academic community. Wonderful experience for me in Madrid. I learned very little Spanish, and returned and went to Puerto Rico.

The students who had majored in Spanish had majored, or course, in Castilian Spanish, which is the "true" standard Spanish, and so when they got to Puerto Rico, people who said "gua-gua" were beyond the pale, I mean, anyone knows that a bus is an "omnibus" and not a "gua-gua."

Thus the City University students went through a process of patronizing the Puerto Ricans whom they had gone there to understand. Eventually the social class gradients got in focus, and there was a realization that students from the City University of New York, in relation to those from the University of Puerto Rico, who were predominantly upper-class, were not having any effect at all in changing the language patterns in Puerto Rico.

It took them at least a semester just to begin to get some sensitivity to the fact that their value system wasn't the dominant value system; that they were there to learn instead of as change agents, and eventually they began to learn.

Diana's paper yesterday brought all of this back, because there is a socio-cultural gradient that's involved in language learning. And the effect of it is not considered at all as we have these discussions. We essentially extract a pure learning of cognitive proportions, without paying any attention to the concomitant affective gradients that accompany these learnings, and also the subtle relationships that are conveyed. I have been concerned here about what I at first identified as hidden agenda, but that would imply complicity and intent, which I don't intend to imply. I think that there are many implicit assumptions, we go along and take for granted much that I think we need to make more explicit. I come as a teacher trainer, I am concerned with teacher education, and I am very much interested in what are the implications of what is being examined here for teacher education. I am concerned about strategies. As we bring together people

who are practitioners or interested in applications, and people who are researchers, I find that the bridge is not made overtly; that we are left to infer the implications for teacher education. I also felt that as I raised questions here, that I was constantly tangential to the ongoing thrust, it was almost as if I were intervening and attempting to change the course or the direction of discussion, which of course was not changed, it was like being a gadfly: I would put in my question, and the discussion continued along the main channel.

The question is: Is there readiness to perceive the questions, even consider the questions. This is not in the framework of the ongoing discussion.

I would like to believe that there could be cross-fertilization. I said that I would like to see the researchers, the trainers of teachers and the classroom personnel get together and have a common cause. Even as I have listened to some of these discussions, it seems to me that there is a movement that is somewhat unilateral, and I wonder how much cross-fertilization goes on between the researchers.

I raised the question: What would happen if the study on eye movement were put together with adverse brain locations? What would happen if we put electrodes in the brains, and found out what happens as those eye pauses take place, what are the gradients in terms of electroencephalograms, and would we get more information? My answer was: "Well, I don't know anything about electrodes." I don't want you to necessarily know about electrodes, I want the two of you to get together and see what comes out of putting together some of the processes.

I think we are very much tied up with political and social orientations, but the reaction that I got to Diana's paper was: "Well, we are caught in this bind, and there is not very much we can do about it, because we are not in the political arena." But I do believe we are. I think that we may go on and do research within the set framework. The hidden agenda are that we are perpetuating and maintaining the status quo, and the question is: "Are we concerned with change?"

As I listened to the discussions, I still see the arena of education being the classroom and the school. I was very interested in Wallach's use of community people, and projected to, "Well, it may make possible for parents to be responsible for beginning reading." I can remember when the mandate came out, "Do not teach your children reading at home, it will be done in the schools." It isn't necessarily being done in the schools, and maybe we can change and break down the walls between school and community. I am confident that middle-class parents are teaching their children to read at home, and that the challenge for the schools is coming from the people who are not capable.

I am concerned about the assumption that there is a direct relation between orthography and production of words. This to me is <u>essentially</u> what we are into when we get into this whole business of the pronunciations in terms of dialect.

Hammond's comment yesterday was very apropos in terms of syntactical production, and it's being identified in terms of subordination and superordination of groups. I thing that we need to identify the essential aspects of learning, and be very cautious about the value systems that get propagated.

I also was concerned about whether or not reading is perceived as part of communication, or whether reading is perceived as an end in itself. I found almost an equation here between reading and communication, or it might have been only by inference, but it seemed as if they were made to be equal.

I see reading as only part of communication. I question whether in the teaching of reading, the primacy of reading as a communication skill is the same as it has been in the past, or whether reading has moved to a secondary or tertiary role in the face of the audio-visual media available to us today. I am convinced that children who watch television, read, even though when they get into classrooms their manifest behavior is that of nonreaders.

I am also wondering whether reading is essential as a tool subject, as it used to be, when there were not the audio-visual media. I am not saying that reading isn't a desirable behavior. I am wondering whether we aren't deterring progress in learning to read by hanging children up on having to master reading skills first, as if it were a foundation for comprehension, thinking, and reasoning. I don't know how much work has been done on this, but it would seem to me that this might be a concern.

As I say this, I realize it is a reading conference, but I would like to perceive reading in a greater context, rather than as if it were the end.

DISCUSSION BY COURTNEY CAZDEN